Welch Allyn®

Service Manual

VS-100/VS-200™

VideoPath Sigmoidoscopes

Welch Allyn Medical Division
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Part 305034

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Service Manual

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Drawings and/or illustrations and/or part numbers contained in this document are for reference purposes only. For current revisions call Welch Allyn customer service.

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About the VS-100/ VS-200 Video Sigmoidoscopes

The Welch Allyn VS-100 screening video sigmoidoscopes and the VS-200 procedure video sigmoidoscopes utilize a Charge Coupled Device (CCD) chip to produce a high-resolution color video image. This chip utilizes 250,000 pixels to deliver a high-resolution image. The video processing circuits are contained in the umbilical connector. Fiber optic bundles transmit light from the umbilical connector to the distal tip of the instrument.

The VS-200 procedure video sigmoidoscope is electrocautery compatible and equipped with a telecommunications port.

The VS100 is used with the VLX-10 Light Source.

The VS200 is used with the VLX-20 Light Source.

More detailed information about the medical details of these Video Sigmoidoscopes is available by calling Welch Allyn Medical Customer Service.

Servicing VS-100 and VS-200 Video Scopes

Servicing Welch Allyn VS-100 and VS-200 Video Sigmoidoscopes:

It is not the intent of this service manual to instruct complete full level service. Some general procedures are shown to provide insight on the complexity of some repairs. Other procedures are shown in more detail to provide help with simple adjustments or inspections. In both cases it is necessary to possess special tooling available from Welch Allyn.

The Video Path VS-100 and VS-200 Video Scopes are complex electronic instruments and as such can only be serviced by skilled technicians who have at their disposal special tools (T-tools made by Welch Allyn), fixtures, custom video adjusting instrumentation, and access to hundreds of the latest repair parts and materials (M-items or special materials approved for use by Welch Allyn).

Simple articulation adjustments and inspections can be performed by technicians outside of the factory only if they have received proper training, are equipped with specialized tools and have received full documentation and drawing packages available from Welch Allyn. However, complete full level service can only be performed by trained technicians at the factory.

Help Information

The Welch Allyn Video Path Sigmoidoscopes and the VLX-10 Light Sources are sophisticated electronic/ electro-mechanical devices. To assure the continued performance of these instruments it is absolutely essential that any and all service and repairs be performed by properly trained and equipped authorized Welch Allyn personnel or agents, using genuine Welch Allyn replacement parts and factory authorized procedures.

Failure to do so will damage the product and invalidate the product warranty.

For technical assistance or to receive an RMA number (return materials authorization) for products requiring service, please contact:
Welch Allyn Customer Service at 800-535-6663

Serial numbers are located on the handle of the instrument.

Please refer to the following operating manuals:
Video Path VS-100 and VS-200 Video Sigmoidoscope operating manuals:

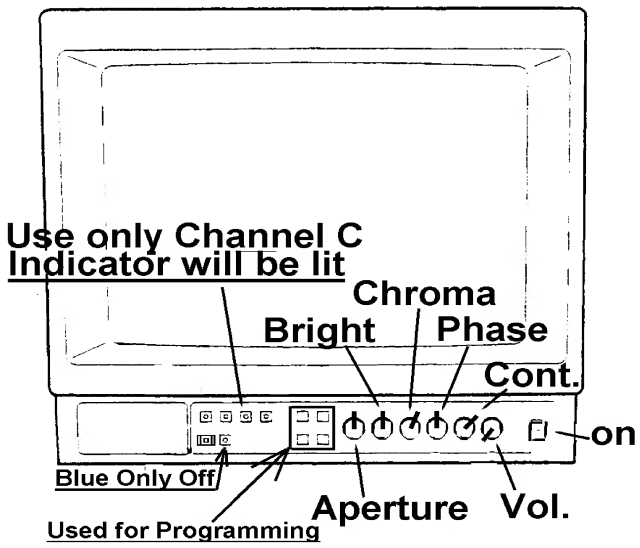
VS-100 Operating Manual part number 305199
VS-200 Operating Manual part number 310199

VLX-10 Video Path Light Source Operating Manual part number 405071.
VLX-20 Video Path Light Source Operating Manual part number 455001.

Video Monitor Default Settings:

The Sony PVM-1350 Video Monitor should be adjusted according to the instructions in the Sony PVM-1350 Owners Manual. The Default Settings for the monitor are explained below.

Front Panel of Monitor



See page 5 of Sony PVM-1350 Operating Instructions for details.

Menu Item No:	Description:	Default Factory Setting:
1	Main Menu	follow instructions
2	Chroma Set up menu	Setting is OFF
3	Caption Vision menu	Setting is OFF
4	User Config 1 menu	follow instructions
5	User Config 2 menu	follow instructions
6	Auto Adjust screen	follow instructions
7	Color System Display menu	setting is AUTO
8	V Hold Screen	adjust only if necessary
9	RGB SYNC menu	setting is SYNC ON G
10	NTSC Setup Level menu	setting is 7.5
11	Language Menu	setting is ENGLISH

Recommended Initial Settings for Monitor

Safety Warnings and Service Notes

Please read and understand the Cleaning and Disinfection instructions in the Operating Manuals for the Video Sigmoidoscopes.

Completely clean and disinfect the instrument prior to any service work, adjustments or inspections.

Safety Warning: Improper cleaning and preparation of any sigmoidoscope can present a biological hazard to the service technician unless he or she follows approved sterilization or disinfection processes.

Flexible Endoscope Specifications

Materials:

Insertion Tubes: Urethane
Umbilical Tubes: Urethane
Bending/Angle Sections: Flourine Rubber

Specifications:

For physical specifications for new scopes refer to owners manuals PN 305199 and PN 310199.

For repair specifications refer to A04049.

Call Welch Allyn for latest revision.

Warning: Improper cleaning and preparation of any sigmoidoscope can present a biological hazard to the service technician unless he or she is follows approved sterilization or disinfection processes.

Warning: It is imperative that flexible Video Sigmoidoscopes and other semi-critical devices be reprocessed such that high level disinfection is achieved with an EPA registered sterilant/disinfectant. It should be noted that any endoscope automated reprocessing device or system* must be cleared for marketing by the FDA via the 510 (k) premarket notification or PMA approval process.

Only reprocessing solutions/systems satisfying the above conditions and tested and found to be compatible by Welch Allyn should be used with Welch Allyn products.

*Liquid chemical germicides (disinfectants/sterilants) to reprocess medical devices come under FDA regulation and new products must, therefore, undergo a 510 (k) premarket notification prior to introduction into interstate commerce.

Safety: Cleaning and disinfection

Cleaning and Disinfection Methods

Become familiar with the Cleaning and Disinfection methods listed in the Owner'sManual. The ETO method requires slightly different preparation procedures. Become familiar with the processes your facility must use for this product. Protective garments should always be worn during the cleaning process to minimize the risk of exposure to biological hazards.

ESD Cautions

Removal of the video boards without proper ESD protection and proper Welch Allyn processes could damage the camera and/or video boards.

Intent of Service Manual and Repair Constraints

Due to the complexity of the VS-100 and VS-200, special tooling and training are required to perfrom full level service. The purpose of this manual is to show some basic service procedures including simple articulation adjustments, inspections, and an overview of bending section cover and braid replacement.

It is not the intent of this service manual to instruct complete full level service. Instead it is a general guide to service procedures to provide insight on the complexity of some repairs. The Video Path VS-100 and VS-200 Video Scopes are complex electronic instruments and as such can only be serviced by properly equipped and trained technicians.

An overview of less complex procedures is shown to provide insight on simple adjustments or inspections. Again, because of the complex and delicate nature of these medical instruments, proper training and full documentation are necessary.

Contact Welch Allyn for information concerning specialized repair training, repair parts, custom tooling, special materials, repair parts, and documentation (drawings, manufacturing and final test specifications) for the VS100 and VS200 scopes. Video adjustment equipment is not available.

At the time of this writing, complete full level service and video component replacement and video adjustment can only be performed by trained technicians at Welch Allyn.

CAUTION: **Before inspecting or servicing scopes it is necessary to either thoroughly *clean and disinfect them or clean and sterilize them* according to the instructions in the Owner's Manual. When the scope has a leak, cleaning can performed if the scope can be pressurized to approximately 2 to 3 PSI. Except for scopes that are leaking badly (cut or torn bending section cover) this will help you clean without flooding it. The scope should then be sterilized with the ETO gas process instead of a liquid process such as STERIS.**

Special Procedure for Scopes with Leaks

Inspection Form

An inspection form is included in the Appendix section of this manual. Inspect the scope prior to performing any service and record your findings.

Service Tooling and Equipment Requirements

Special service tools (T-tools) required for full service are listed on the next page. These are custom made by by Welch Allyn. Special video adjusting instrumentation is not available.

Common tools required for service:

Electronic technicians tool set including diagonal wire cutters and jewelers screwdriver set with small Phillips and flat blade screwdrivers
ESD soldering station
ESD bench/mat/wrist strap
3/32" hex drive 1/4" hex bit
assorted toolmakers files

Required equipment:

Welch Allyn VLX-10 Light Source
Vacuum Pump
Compressed air source
digital postage scales for measuring epoxy components
Electrical test equipment for measuring ground continuity and leakage current Per UL 2601sec.3 par.19.3, 19.4-table 4

Special Service Tools

T Number	Description
T11513-12	TF O-Ring Tool .140 Dia. X 1.25
T12035	Oetiker Pliers
T12728	Clamp Only
T12754	Spanner -Torque Wrench Suction Barb Nut
T12756	ETOTool
T12762	Pull Tool
T12768	Bending Section Cover Tool
T12771	Spanner
T12772	Knob Torque
T12773	Knob Torque
T12779	Spanner (Biospy Onlet Barrel)
T12801	Stay Coil Collar
T12860	Spanner - Torque Wrench ETO Vent Screw
T12861	ETO Ass'y Holding Fixture
T12895	Umbilical Housing Air/Water Tool
T12979	Clamp Tool
T13004	CB/IT/UM Plumbing Assy Fixture Clamp Only
T13011	Ball Gages
T13086	Spanner - Torque Retainer Nut
T13132	Rotat. Holding Fixture
T13210	Holding Fixture Scope Sub-Assembly
T13211	Heat Sizing Tool (3.6mm Suction)
T13225	Hypertronics Pin Spanner
T13321	Tube Length Gage

Special Service Tools

T Number	Description
T13325	Tubing Pliers (Air)
T13402	Thread Wrap
T13428	Spanner
T13429	Spanner
T13477	Heat Sizing Tool (Umb Water)
T13478	Heat Sizing Tool (Umbl Air)
T13479	Heat Sizing Tool (C/B Water)
T13483	Lug Solder Gage
T13539	Tubing Pliers (Water)
T13540	Tubing Pliers (3.2mm Suction)
T13602	Spring Guide Seperator
T13810	GC 2.7mm Ball Gage
T13937	Tubing Pliers (2.7mm Suction)
T13966	Heat Sizing Tool (2.7mm Suction)
T13988	Forward Body Trim Attaching Nut Wrench
T13987	Body Cover Grip Attach Nut Wrench
T13989	Pentax ST-3124 Insertion Tube Attaching Nut
T13990	Spanner
T14133	Heat Sizing Tool Water Line Splice
T14134	Heat Sizing Tool Air Line Splice
T14177	Service Staging Tool
T14924	Hypertronics Position Fixture
T1562-17	GA0.5-36 IN/LBS Torq WR-Mountz 02-0080
T1562-19	GA0.5-36 IN/LBS Torq WR-Mountz 02-0082
T1562-20	GA10-120 IN/LBS Torq WR-Mountz 02-0061
T15706	Rear Housing Jam Nut
T16427	Video Path Scope Board

Care and Maintenance Tips

Flexible endoscopes have been an invaluable tool in the medical community's armamentarium to successfully diagnose and treat a wide variety of illnesses in patients for several decades. Perhaps due to their longevity and progressive design changes over the years which have simplified their use, flexible endoscopes have been somewhat taken for granted and have erroneously not been considered highly technological medical devices.

In fact, current generation flexible endoscopes, although easier to clinically use, are more sophisticated than ever. Special reprocessing instructions must be followed to make sure the instruments are patient ready and patient safe. Special care and handling must be exercised and practiced to prevent instrument malfunction and prolong the reliability of the endoscope.

The burden of responsibility to make sure of safe and reliably functioning instruments is left in the hands of the healthcare professionals who actually care for and reprocess flexible endoscopes.

Naturally, equipment manufacturers share this responsibility and tremendous efforts have been spent in designing instruments which could be reprocessed and maintained as easily as possible. However, due to the nature of their use and application, flexible endoscopes must be subjected to special cleaning procedures, followed by a disinfection or sterilization process after each and every patient use.

To highlight and simplify what may appear to some as being complicated maintenance and reprocessing instructions, Welch Allyn strongly recommends that users review the following suggestions and advice on the care and maintenance of your Welch Allyn flexible VideoEndoscope.

These tips, particularly those involving scope reprocessing, should not be construed as "shortcuts" and are not intended as substitute directions for complete instructions found elsewhere in the owner's manual.

- Avoid soaking of the instrument with accessories (e.g., forceps, injection or aspiration needles) or any sharp-edged objects which could inadvertently scratch or cut the distal bending section sheath. (Subsequent flexing back and forth of the rubber sheath could eventually stretch the scratched rubber until a pinhole appears and leak develops.)
- Exposure to a compatible enzymatic detergent is essential to thorough cleaning of all surfaces of the instrument. Rinsing and drying after cleaning is imperative to prevent dilution of the disinfectant/sterilant.
- Do not reuse disposable accessories intended for single patient or one-time use.
- Do not expose the instrument or accessories to harsh chemical solutions. Strictly adhere to exposure times recommended by the manufacturers of compatible solutions.
- Avoid contact of any flexible portion of the instrument with any sharp objects (e.g., bed frames, table top corners, sink drains, accessories hanging in storage cabinets) at any time during the handling, reprocessing, or storage of the instrument.
- Avoid stretching of the bending section rubber sheath at the distal portion of the scope. During mechanical cleaning of the instrument with a dampened gauze, do not use excessive force. A gentle back and forth wiping motion should be sufficient to remove gross debris. Subsequent soaking in an enzymatic detergent will clean the remainder of the debris.
- Disinfectants and sterilants are toxic substances by nature. All residual solution must be thoroughly rinsed and dried prior to each patient use.
- The key to preventing clogged air or water channels/nozzles is to immediately flush the channels upon removal from the patient. This should be followed by soaking with an enzymatic detergent.

Care and Maintenance Tips (continued)

- Avoid attempting to remove or unscrew the instrument's components which should not be removed. Parts such as the distal portion on the end of the bending section and any rubber strain reliefs on either the insertion tube or umbilical cord are essential to the watertight integrity of the instrument. Removal or loosening of these components and subsequent immersion could lead to fluid invasion into the instrument.
- Avoid excessive and/or tight bends in the insertion tube and umbilical cord. Tight curling of these portions of the instrument can result in serious internal damage.
- Never articulate the bending section by applying force directly to the bending section. This can cause serious damage to the internal steering cables.
- If resistance is felt during rotation of the deflection control knobs, do not apply excess force.
- Check for any sharp edges on all surfaces of an automated cleaning/reprocessing unit which may come in contact with an endoscope. Some units may have sharp edged wire mesh filters and baskets or inlet/outlet ports which could damage the instrument.
- The air/water and suction control valves must be screwed down onto their respective cylinders on the instrument's control body to function properly. This is unlike other manufacturer's semi-disposable valves with a rubber base which do not have threads to secure attachment.
- Do NOT overtighten the cap to the water bottle assembly. Overtightening could cause the cap to crack.
- Do NOT introduce air bubbles into the instrument's internal channels during flushing of cleaning and/or disinfecting/sterilizing solutions since the bubbles could interfere in the effectiveness of the disinfection/sterilization process.
- Do NOT store the instrument and accessories in the carrying case since this type of dark, humid, and unventilated environment is conducive to bacteria colonization which increases the risk of cross-contamination.
- Prior to each use, check the condition of all accessories.

  Do NOT use any accessories with kinked or bent flexible shafts.

  Do NOT use forceps with misaligned cups and/or bent needles/spikes.

  Do NOT use aspiration or injection needles which are not retractable or whose sharp tips cannot be protected.

  DO NOT use cleaning brushes without smooth or rounded distal tips.

  Use of any of the above accessories could result in channel damage and costly repairs.
- Verification of the effective concentration of glutaraldehyde (via test strips or similar methods) is recommended to ensure potency of glutaraldehyde to achieve high-level disinfection.
- Instrument repairs should be performed by an authorized Welch Allyn service facility. Welch Allyn assumes no liability for any patient/user injury, instrument damage or malfunction, or reprocessing failure due to repairs made by unauthorized personnel.

Cleaning of the Air / Water Nozzles

1. Soak the distal end of the scope in enzymatic solution for approximatley 10-15 minutes.

2. Gently brush the air and water nozzles in the distal tip of the instrument with the air/water nozzle cleaning brush provided to dislodge any debris. Care should be taken to not push any debris back into the air and water lines. See Figure 1

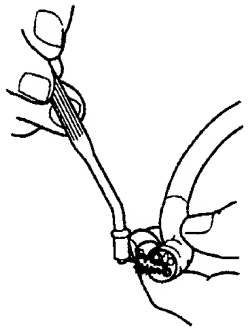


Figure 1

3. Keeping the distal tip in the container of solution, turn air switch "ON", depress the air/water feed valve (green valve) for 5-10 seconds. Release the valve and cover the hole on top for 5-10 seconds. This will expel any mucous, debris, etc. which may have entered the air and water nozzles during the procedure. See Figure 2

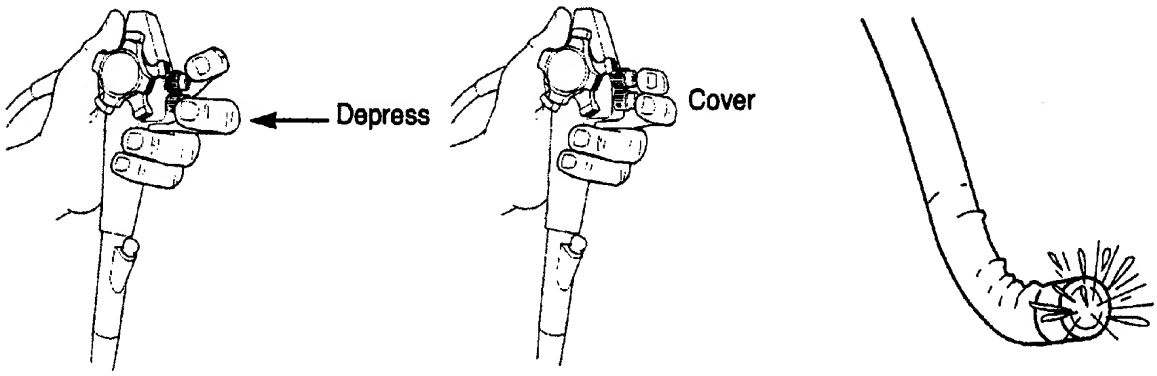


Figure 2

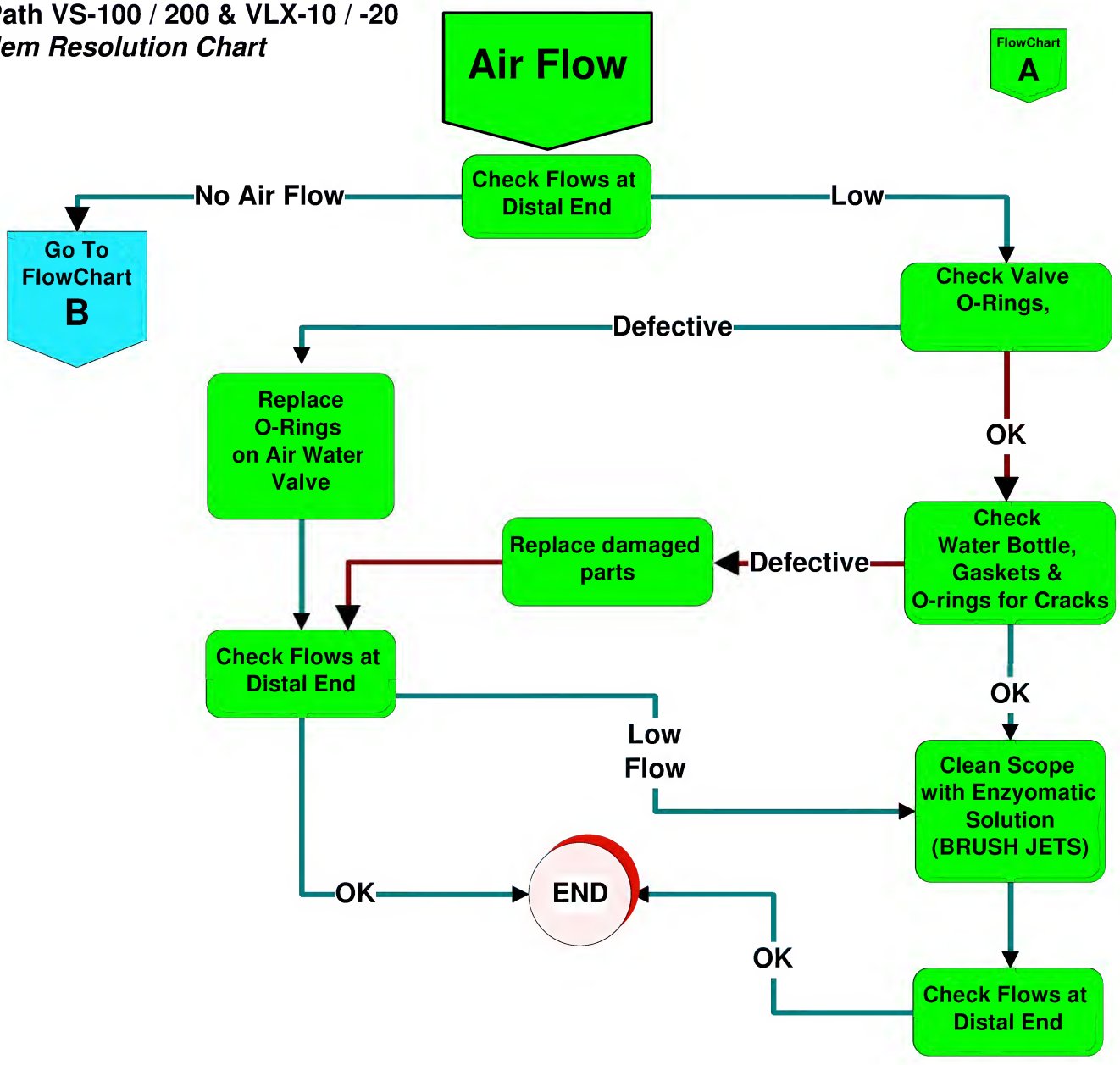
Chief Complaint	Possible Cause	Solution
Image is not clear	A) Distal objective lens obscured.	A) Rinse lens by injecting water through auxiliary water inlet.
	B) Camera lens is dirty.	B) Remove endoscope and clean distal objective lens with cotton swab and alcohol. Polish lens with a soft cloth. Use a wooden toothpick dipped in alcohol to remove hardened matter from lens.. DO NOT USE HARD OBJECT! Do not clog sprayers with toothpick material.
	C) Water damage to lens.	C) Fix leak, clean lens.
No video image on monitor. Screen is dark	A) Video connector plug is loose or pins on connector are bent, missing or loose.	A) Replace connector. Pins can not be straghtened as they will break Check the SVHS cable plug for bent or missing pins. Check the cable for signs of crushing or cuts.
	B) Umbilical plug is not fully inserted into the light source.	B) Fully insert umbillical plug
	C) Possible flooded scope	C) Dry out scope, repair leak and replace board set and any corroded components.
	D) Other equipment may have a problem such as Power Off or loose connections.	D) Check other equipment. Check all cables and connectors are plugged into correct jacks.
	E) Monitor Input Selection	E) Select “Channel C" Refer to Recommended Initial Settings for Monitor in Section 1 Page 3 of this manual.
Poor Color on Image	A) Possible incorrect Monitor adjustment.	A) Read Monitor owners manual and adjust accordingly.
	B) Defective SVHS cable	B) Substitute ‘known good’ **SVHS** cable and check the color.
Image is Black and White only. NO COLOR	A) Possible defective SVHS cable or connectors	A) Replace with known good cable. Inspect connectors on light source.
	B) Connectors not plugged in completely	B) Check and restore connections
	C) Bent pin at umbilical plug	C) Replace connector. Pins are brittle and can not usually be straightened without breaking them.
	D) Monitor Setting is set to BLUE ONLY	D) Deselect BLUE ONLY Refer to Recommended Initial Settings for Monitor in Section 1 Page 3 of this manual.
Rolling Colors appear on monitor	A) Possible damaged SVHS connector	A) Check and replace as necessary.
Light Guides have no illumination	A) Light source not turned on.	A) Turn on power to light source.
	B) Light source lamp broken	B) Replace lamp
	C) Light guides broken	C) Replace light guides (insertion tube replacement)
Light Guides have poor illumination.	A) Light guides pins have dirt on them	A) Inspect and clean light guide pins on umbillical plug.
	B) Light guide lenses dirty	B) Inspect and clean light guide lenses.
Light Source not working	A) Not plugged into electrical outlet.	A) Check mains voltage.
	B) Lamps burned out.	B) Replace lamps according to instructions.
	C) Fuse is blown.	C) Replace fuse(s)

Chief Complaint	Possible Cause	Solution
No or Low Suction	A) Suction valve blocked.	A) Remove valve, clean valve and housing with a cleaning brush. Lubricate "O" rings with valve lubricant and replace. Check for debris in bottom of suction valve body.
	B) Biopsy seal is worn.	B) Replace biopsy seal.
	C) Suction channel is blocked.	C) Clean entire suction channel per instructions in Owners Manual.
	D) Suction pump not on or tubing disconnected.	D) Verity good connection between suction pump and endoscope. Turn pump on.
No insufflation	A) Pump not turned on.	A) Turn air pump on. Test endoscope for air flow.
	B) Water bottle not connected properly to light source.	B) Verify water bottle is properly plugged into light source.
	C) Air nozzle is blocked. Unflushed cleaning solution will clog nozzles.	C) Soak tip of endoscope in warm soapy water for 2-3 minutes. Gently brush with air/water nozzle cleaning brush. Gently inject warm water through the endoscope by depressing the air water feed valve. See Section 2 Page 9
	D) Water bottle cap not secured tightly.	D) Tlghten cap.
Can not irrigate. No or low air/water.	A) Water bottle empty.	A) Fill water bottle to fill line.
	B) Water bottle cap not secured tightly.	B) Tighten cap.
	C) Dip tube is missing in the procedure water bottle. There is a difference between the procedure water bottle and the cleaning bottle.	C)The Cleaning water bottle has two dip tubes. The procedure water bottle has only one dip tube. Follow step E below.
	D) Water bottle 0 rings missing or split	D) Install good "0" rings on fittings
	E) Nozzles clogged. Unflushed cleaning solution will clog nozzles.	E) Soak distal end of insertion tube in enzymatic solution for 15 minutes then brush nozzles with the brush supplied with the scope. Then completely flush all channels of enzymatic solution immediately afterwards. See Section 2 Page 9
	F) Valve 0 rings defective or missing	F) Install "0" rings and apply correct lubricant
A steady stream of water comes out of the top of the air/water button when the pump is activated.	A) Valve is not fully seated	A) Check valve body for debris and fully install valve. Residual water from previous cleaning within channels may cause stream water to come from a good air water valve. Always purge lines of water after every cleaning. Note: the air water valve has a green ring on top and is fitted with four clear "0" rings. The suction valve has a red ring on top and is fitted with three black "0" rings.
Suction or Air/Water valve sticks	A) Dirty stem valve.	A) Remove valve: clean valve and housing with cotton swab and alcohol; lubricate “0” rings with valve lubricant and replace.
Biopsy seal “spitting’ or leaking	A) Biopsy seal is worn.	A) Replace biopsy seal.

Chief Complaint	Possible Cause	Solution
Scope does not articulate in one or more directions	A) Broken Cable	A) Listen for broken cable scrathing inside of insertion tube. Replace broken wire. A bent or kinked insertion tube is an indicator of broken wire.
Articulation does not meet specifications	A) Free Play excessive due to stretched cables or collapsed insertion tube	A) Adjust free play.
	B) Broken vertibrae	B) Replace worn or broken vertibrae.
	C) Loose articulation knob. screws	C) Inspect and tighten knob
Scope Fails Ground Test	Broken ground wire or loose internal connection.	Inspect, restore and retest
Printer does not respond to handle buttons (VS-200)	A) Printer needs to be reset.	A) Reset printer by turning Off then On again.
	B) The printer is not configured properly.	B) Make sure dip switches are set to the 9,600 Baud Rate. For Sony UP-1800, UP-1850, and UP-1200 models: Set Dip Switches # 3 and # 4 to ON. All other dip switches should be set to OFF. RESET the printer by turning it Off then On again after dip switches have been changed.

Troubleshooting Flowcharts for Customer Service

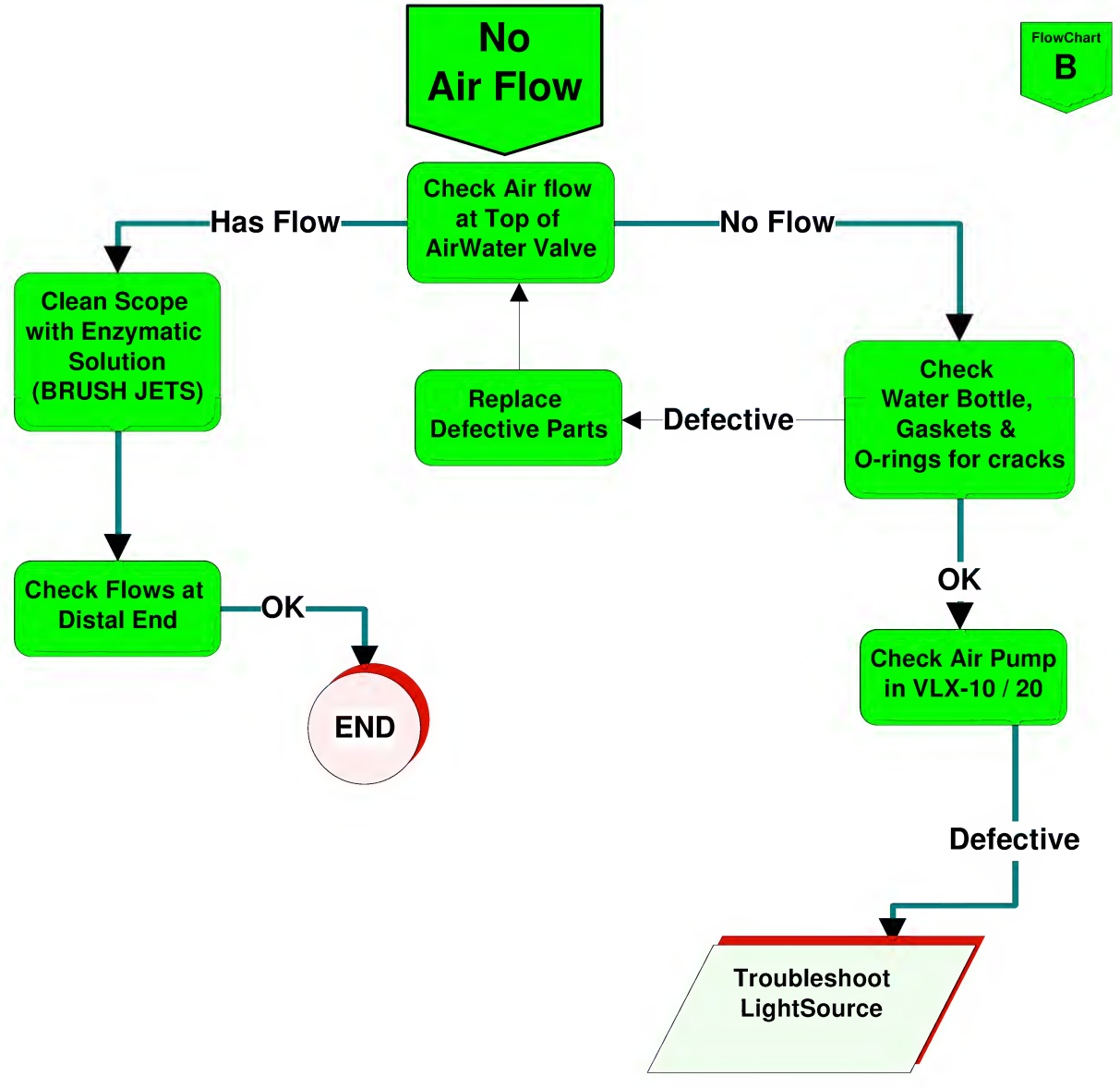
VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart



Troublshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20

Problem Resolution Chart



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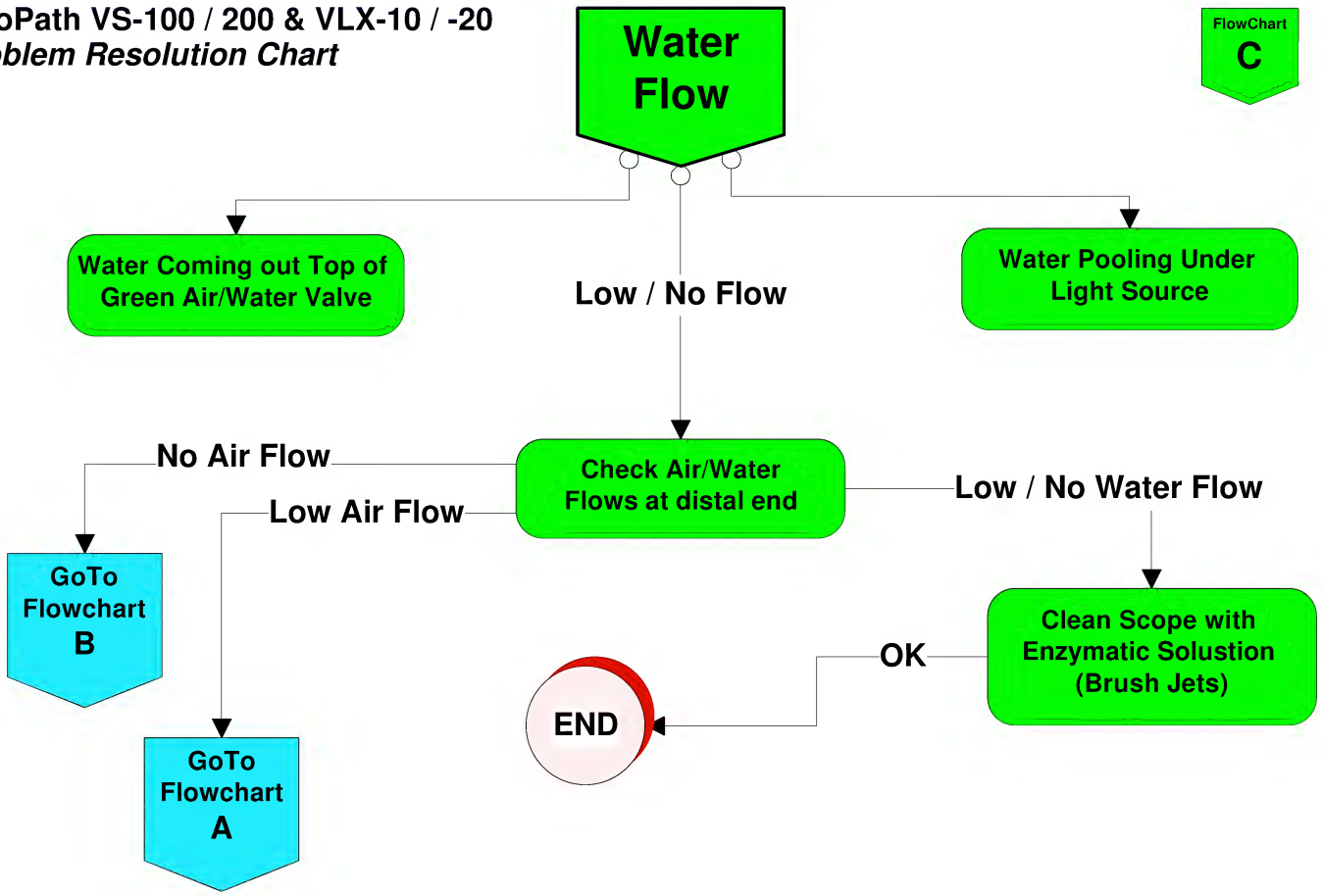

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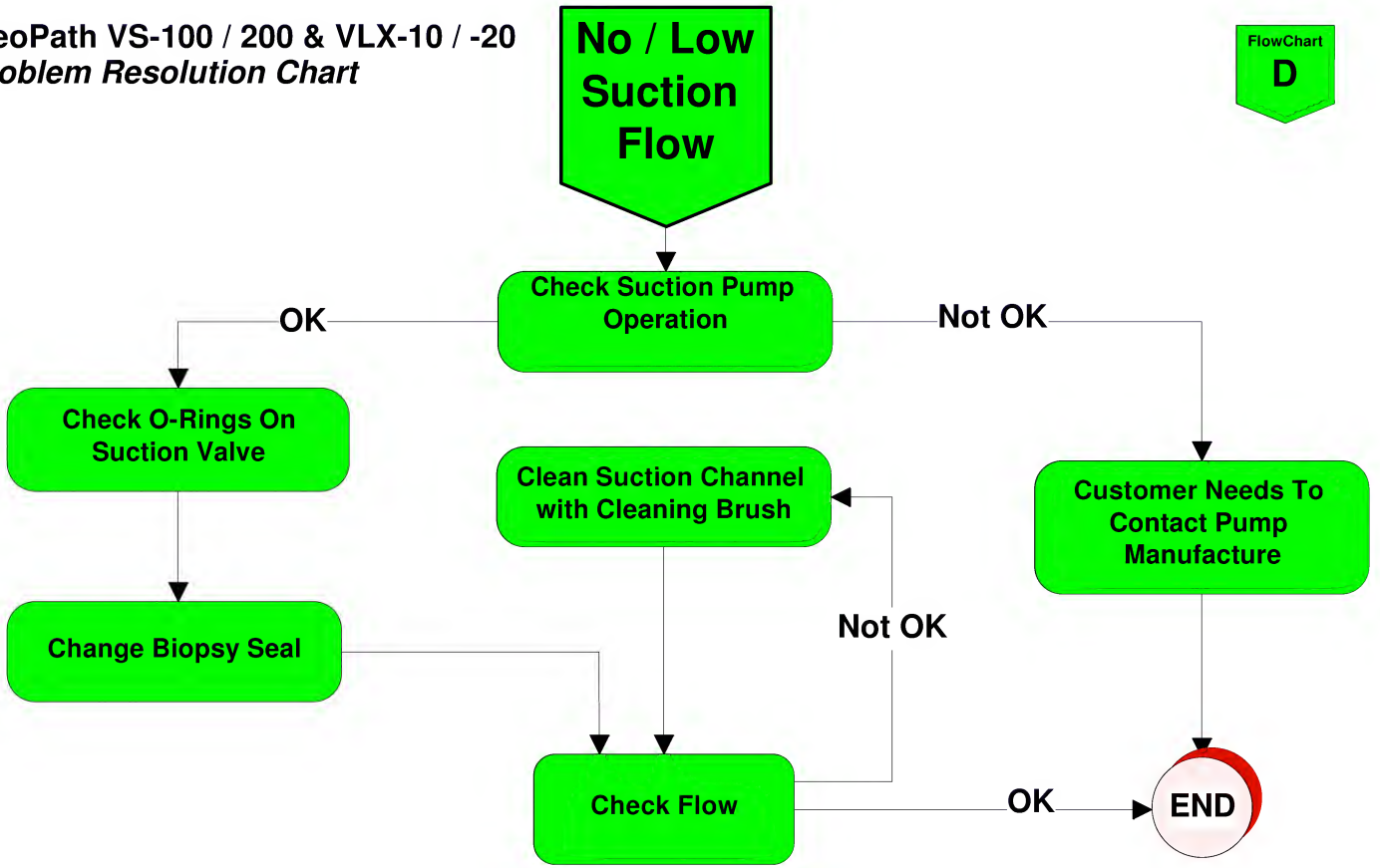

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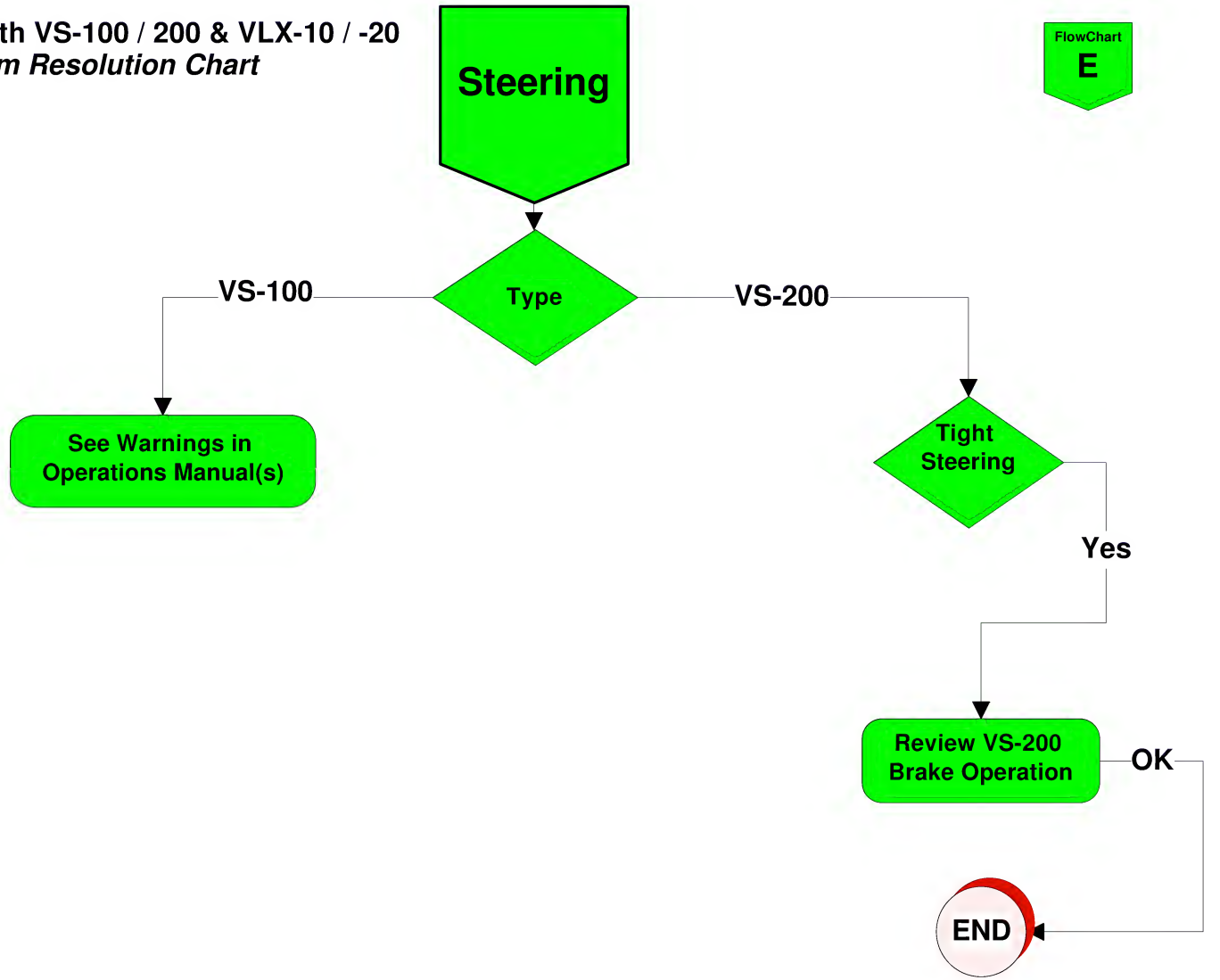

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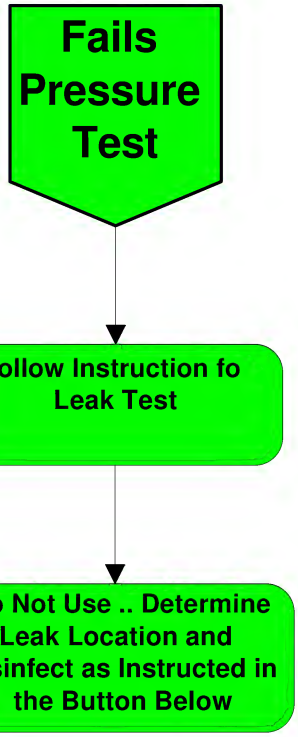
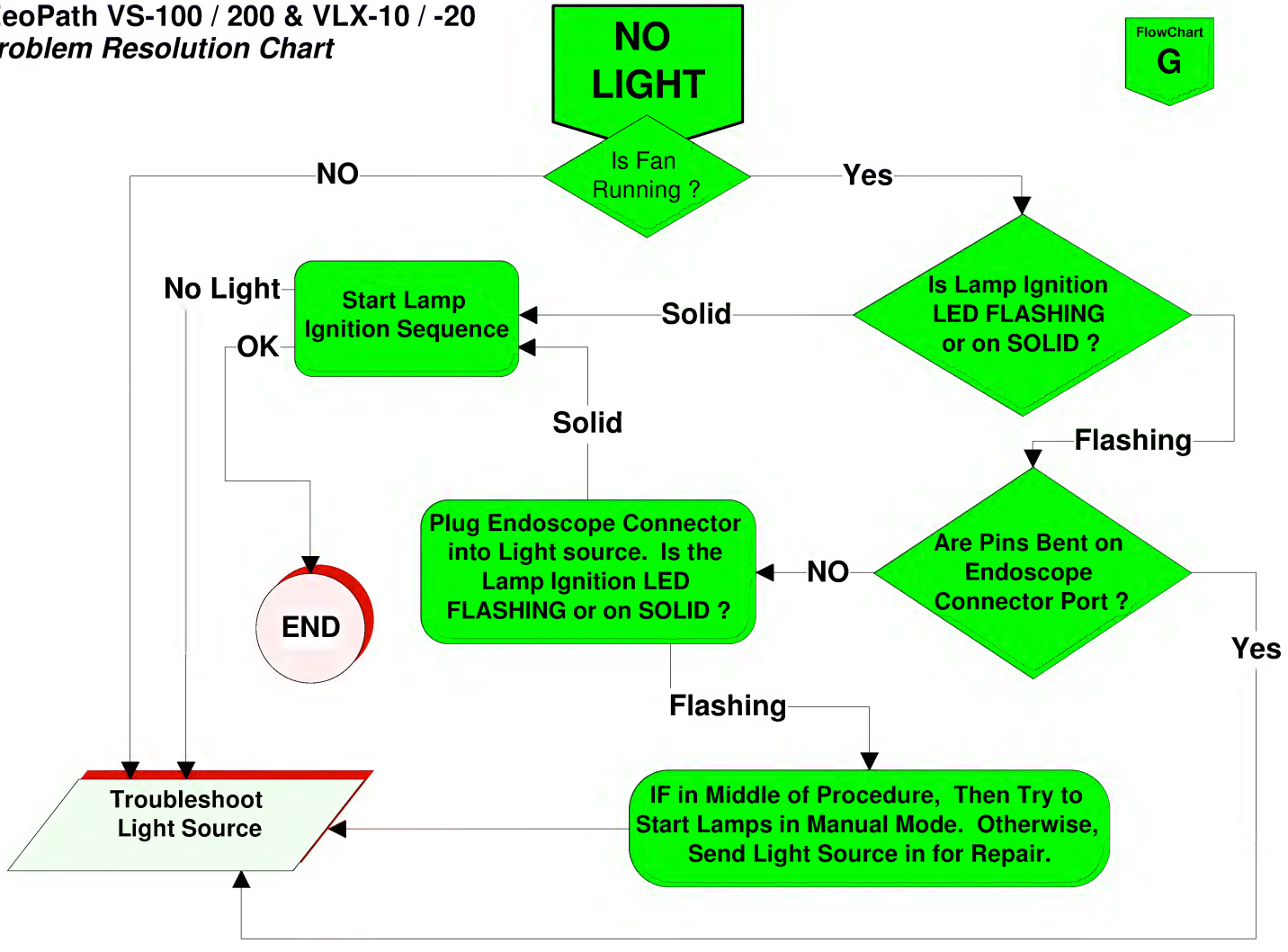
Problem Resolution Chart


Fails Pressure Test
Follow Instruction fo Leak Test
Do Not Use .. Determine Leak Location and Disinfect as Instructed in the Button Below

FlowChart F

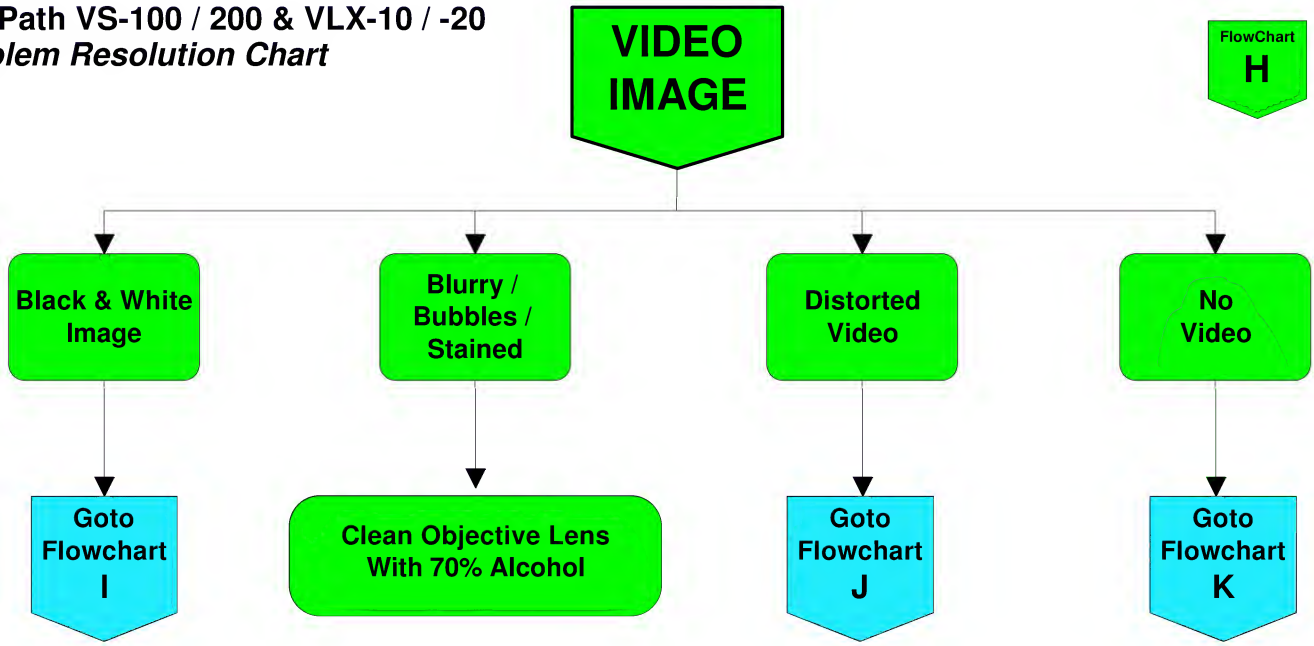
Troubleshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart


NO LIGHT
FlowChart G
Is Fan Running ?
NO
Yes
Is Lamp Ignition LED FLASHING or on SOLID ?
Solid
Start Lamp Ignition Sequence
No Light
OK
Solid
Flashing
Are Pins Bent on Endoscope Connector Port ?
NO
Yes
Plug Endoscope Connector into Light source. Is the Lamp Ignition LED FLASHING or on SOLID ?
END
Flashing
IF in Middle of Procedure, Then Try to Start Lamps in Manual Mode. Otherwise, Send Light Source in for Repair.
Troubleshoot Light Source

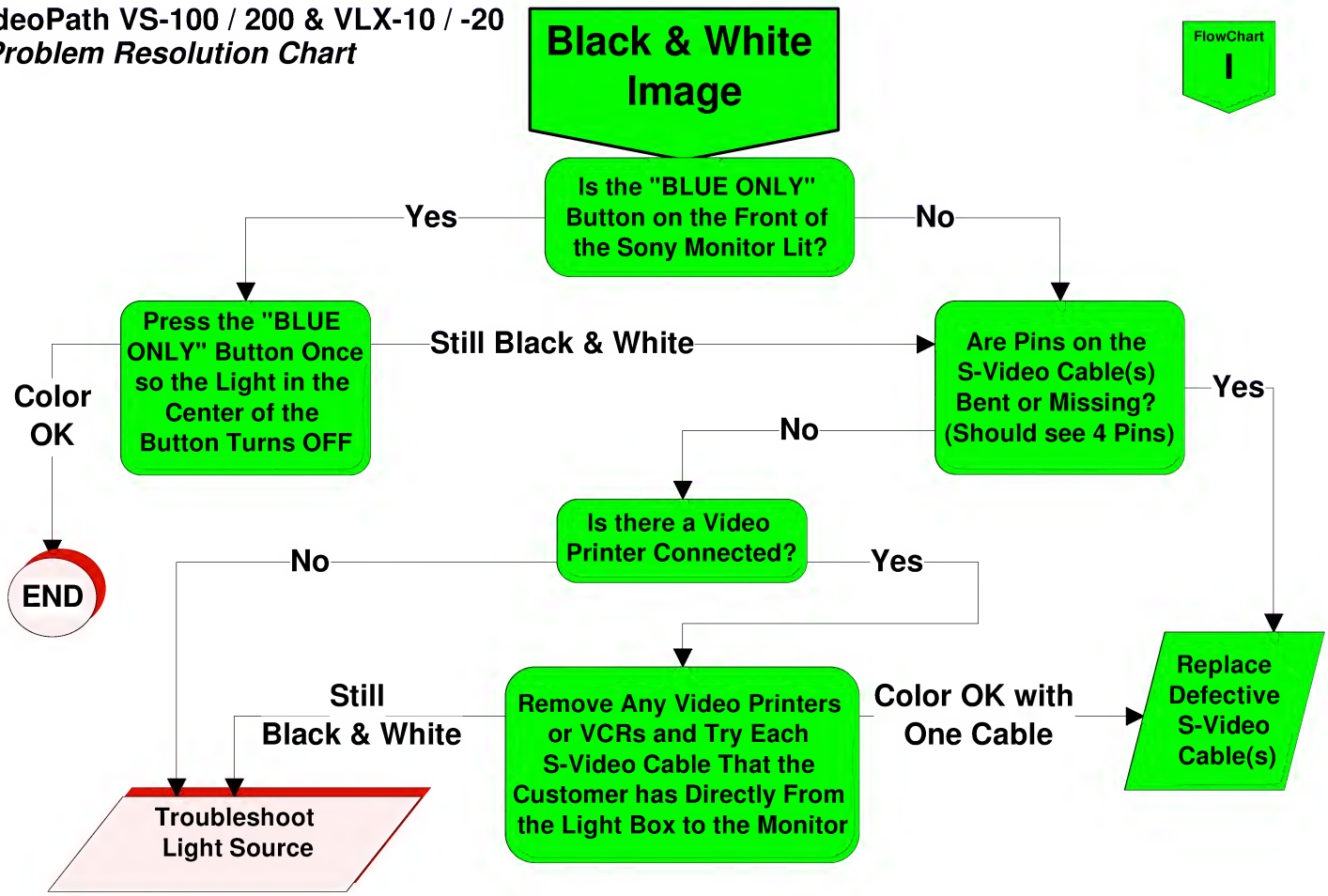
Troublshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart



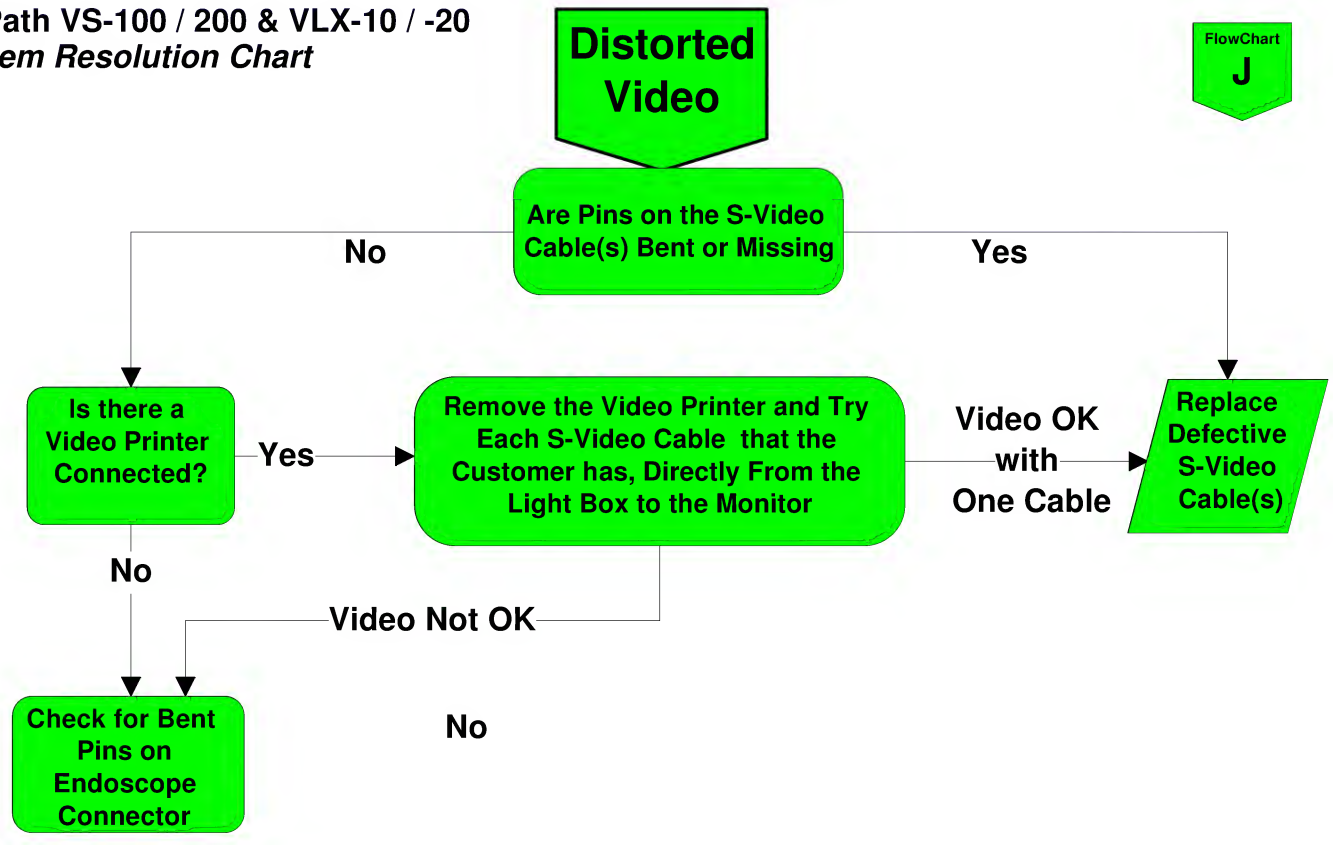
Troubleshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart


Black & White Image
FlowChart I
Is the "BLUE ONLY" Button on the Front of the Sony Monitor Lit?
Yes
No
Press the "BLUE ONLY" Button Once so the Light in the Center of the Button Turns OFF
Still Black & White
Are Pins on the S-Video Cable(s) Bent or Missing? (Should see 4 Pins)
Yes
No
Color OK
END
Is there a Video Printer Connected?
No
Yes
Still Black & White
Remove Any Video Printers or VCRs and Try Each S-Video Cable That the Customer has Directly From the Light Box to the Monitor
Color OK with One Cable
Replace Defective S-Video Cable(s)
Troubleshoot Light Source

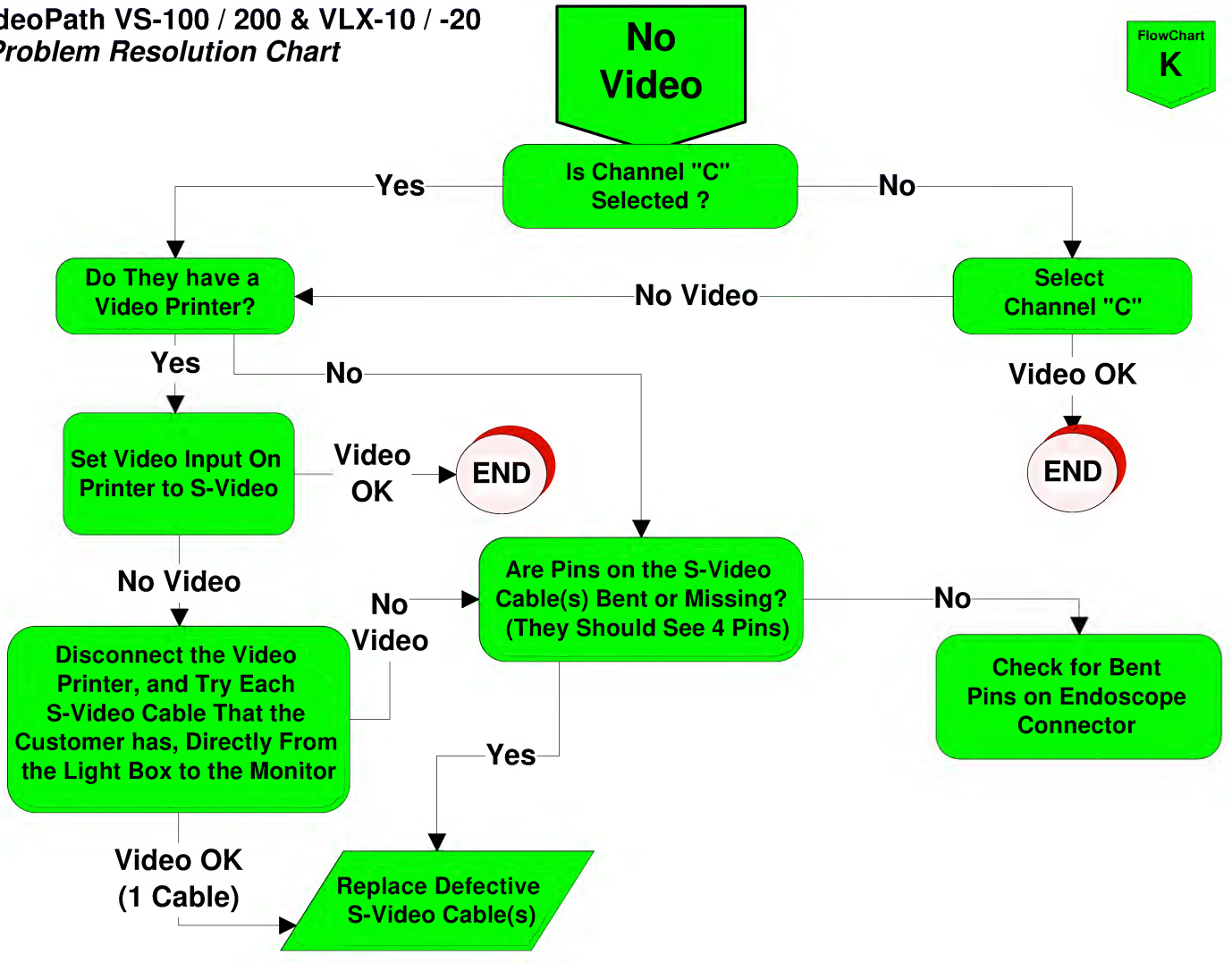
Troublshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart


Distorted Video
FlowChart J
Are Pins on the S-Video Cable(s) Bent or Missing
No
Yes
Is there a Video Printer Connected?
Yes
Remove the Video Printer and Try Each S-Video Cable that the Customer has, Directly From the Light Box to the Monitor
Video OK with One Cable
Replace Defective S-Video Cable(s)
No
Video Not OK
Check for Bent Pins on Endoscope Connector
No

Troublshooting Flowcharts for Customer Service

VideoPath VS-100 / 200 & VLX-10 / -20
Problem Resolution Chart



NOTE:Components of the VS-100 and VS-200 are ESD sensitive.

4.1.1 Preparation for removal of bending section cover: thoroughly clean and sterilize scope. clear all channels of water.

4.1.2 Remove old bending section cover.

4.1.3 Inspect :
- a) the braid for loose wires
- b) the objective head for clogged nozzles
- c) camera lens for scratches / leaks
- d) light guide lenses for scratches/leaks
- e) suction port for epoxy blockage

4.1.4 Place a new bending section cover on bending section using tool T-12768.

4.1.5 Seal the ends of the bending section cover over with epoxy.

4.1.6 Put the scope in T-14177 Staging Tool and secure the bending section in the chuck of T-13402.

4.1.7 Secure the bending section cover to the scope by wrapping the ends with monofilament line (m-11448 .128mm).

4.1.8 First wrap the monofilament around the bending section cover at the insertion tube/ bending section joint.

4.19 Finish the wrapping process at the objective head end.

4.1.10 Cover the monofilament line with epoxy and allow to cure while slowly rotating in thread wrap fixture for approximately 24 hrs. Break any bubbles that appear during the early curing process.

4.1.11 Perform a leak check on bending section cover.

4.1 VS-100/VS-200 Outline of Bending Section Cover Removal and Replacement

Note: Whenever the insertion tube assembly (camera) or video boards are removed or replaced with new ones, video adjustments must be performed. This work is done at the factory by a specially trained video technician on special video equipment.

T-12768 Bending Section Cover Tool

Scope is held in T-14177 Service Staging Tool Assembly.

T-14177 is then attached to T-13402 Thread Wrap Fixture

4.2 VS-100/VS-200 Outline of Bending Section Braid Removal and Replacement

Braid fastened with monofilament and adhesive.

4.2.1 Remove bending section cover.

4.2.2 Carefully cut epoxy holding the braid.

4.2.3 Remove braid from bending section.

4.2.4 Inspect and clean vertibrae.

4.2.5 Position a clean braid onto the insertion bending section. Mark and cut to length.

4.2.6 Fasten braid to bending section with monofilament line and adhesive..

4.2.7 Secure braid with epoxy then clamp.

4.2.8 Allow epoxy to cure at room temperature for a minimum of 2 hours.

4.2.9 File any bumps or ridges of cured epoxy left over from the clamps.

4.2.10 Install bending section cover.

4.3 VS-100/VS-200 Outline of Articulation Checks and adjustments

Articulation check using sheet found in Appendix

General Information about Articulation checks and adjustments:

The service specifications for articulation are found in A04049. Call Welch Allyn for latest revision.

Articulation adjustments require the removal of the handle housing as explained in section 4.1.1.
There are two levels of articulation adjustment:

a) Simple slide stoppers/move stoppers.
b) Advanced melt solder and slide adjusting col lars towards the insertion tube.

Note: Misalignment of the up-down and left-right symbols on the knobs does not indicate the need for an articulation adjustment. Knobs can be re-aligned by a simple procedure as explained in section 4.4

4.3.1 Remove handle housing for both types of adjustment.

4.3.2 Inspect alignment in both up-down and left-right orientation. Record results.

4.3.3 Remove root brace.

4.3.4 Unscrew forward body trim cover attachment nut.

4.3.5 Remove trim collar and two 0 rings.

4.3.6 Remove biopsy inlet attaching nut and remove biopsy inlet.

4.3.7 Remove forward body cover.

4.3.8 Unscrew body cover grip attaching nut and open body cover grip.

4.3.9 Perform articulation adjustment as follows: .

4.3.9.1 Loosen two phillips head set screws for each ***up-down*** stopper (visible through the cutout in the chrome cover). Use 00' size phillips head screwdriver

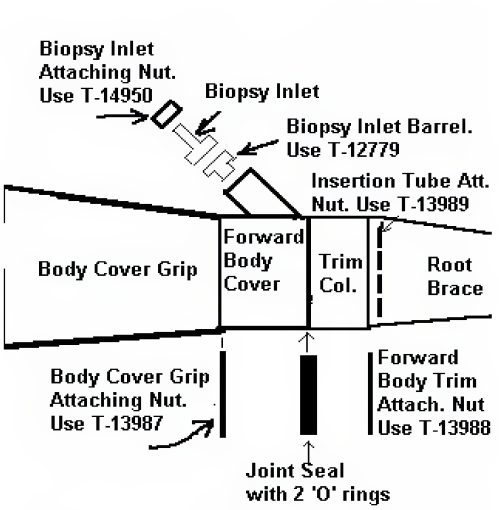
4.3.9.2 Articulate the scope to the desired position.

4.3.9.3 Adjust the stopper, either right or left, until it contacts the connector receptacle at cthe desired articulation angle.

4.3.9.4 Relocate the screws to allow contact at the desired articu alation angle if there is not enough movement to allow the stopper to contact the connector receptacle.

4.3.9.5 Tighten both screws on the stopper and re-check articulation.

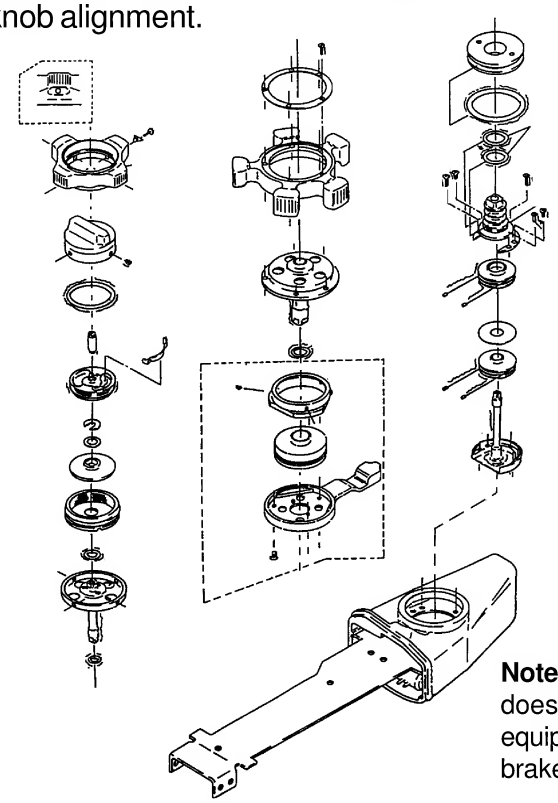
4.3 VS-100/VS-200 Outline of Articulation Checks and adjustments continued


Biopsy Inlet Attaching Nut. Use T-14950
Biopsy Inlet
Biopsy Inlet Barrel. Use T-12779
Insertion Tube Att. Nut. Use T-13989
Body Cover Grip
Forward Body Cover
Trim Col.
Root Brace
Body Cover Grip Attaching Nut. Use T-13987
Forward Body Trim Attach. Nut Use T-13988
Joint Seal with 2 'O' rings

Representation of attaching nuts and required 'T'tools needed to remove them. All 'O' rings are not shown.

4.4 Outline of Knob alignment (removal and replacement Including O rings)

Note: this procedure is for scopes that have the correct articulation and free play, but have incorrect knob alignment.



Note: The 30500 does not come equipped with brakes.

4.4.1 Pry top label off with flat blade screw driver. Be careful not to scratch the spacer.

4.4.2 Remove the slotted head screw from the cen ter of the Right Left Brake replacement cap.

4.4.3 Pry the cap up.

4.4.4 Remove lockwasher (C clip).

4.4.5 Remove brass washer.

4.4.6 Remove stainless steel spacer.

4.4.7 Lift the knob and its shaft from the center shaft.

4.4.8 Remove 'O' Ring from top of left-right shaft if necessary. (Coat new O rings with vaseline during reassembly and do not re-use old O rings in areas of suspected leaks.

4.4.9 Pull left-right knob up off of main shaft. (Tthe left-right knob screws are covered with black RTV M30389.)

4.4.10 If the ***left-right*** knob is out of alignment by approximately 90 degrees, follow the procedure below to re-align the knob. Make a 90 degree adjustment of the left right knob:

4.4.10.1 Pull knob up and out of handle.

4.4.10.2 Inspect O ring under knob.

4.4.10.3 Rotate knob (in 90 degree increments) to realign.

4.4.10.4 Insert knob into handle until it fits all the way in engaging the pulley.

4.4.11 If the ***left-right*** knob is out of alignment by approximately 120 degrees, follow the procedure below, to re-align the knob. Make a 120 degree adjustment of left right knob:

4.4.11.1 Remove 3 slotted flat-head screws from hub.

4.4.11.2 Rotate knob to re-align. For example: 120 degrees minus 90 degrees adjustment will result in a net 30 degree shift if necessary.

4.4.12 Remove bottom O ring of steering assembly:

4.4.12.1 Pull up-down knob up out of handle.

4.4.12.2 Inspect 'O' ring on knob shaft.

4.4.12.3 Pull up down spacer off of handle.

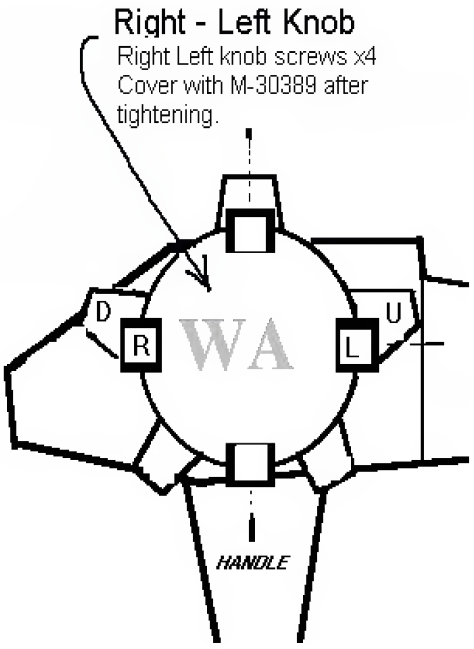
4.4.12.4 Remove 'O' ring from outer shaft just above cover.

4.4.12.5 Unscrew cover with T-13990 wrench

4.4.12.6 Remove cover 'O' ring

4.4.12.7 Remove 'O' ring under cover

4.4 Outline of Knob alignment (removal and replacement Including O rings) continued



4.4 Outline of Knob alignment (removal and replacement Including O rings) continued

4.4.13 If the ***up down*** knob is out of alignment by approximately 90 degrees, follow the procedure below to re-align the knob. Make a 90 degree adjustment of the up down knob:

4.4.13.1 Pull the knob up and out of handle.

4.4.13.2 Inspect the O ring under the knob.

4.4.13.4 Rotate the knob in 90 degree increments to realign.

4.4.13.5 Insert the nob into the handle until it engages the pulley.

4.4.14 If the ***up-down*** knob is out of alignment by approximately 72 degrees follow the procedure below to re-align the knob. Make a 72 degree adjustment of the up-down knob:

4.4.14.1 Remove RTV from the five screws in the black anodized wheelof the up-down knob or bottom knob.

4.4.14.2 Establish a starting point by scribing a mark pointing to the “U” on the knob. DO NOT scribe a mark on the plastic knob.

4.4.14.3 Remove five screws.

4.4.14.4 Rotate the knob (in 72 degree increments) to realign.

4.4 Outline of Knob alignment (removal and replacement Including O rings) continued

4.4.15 If the ***up down*** knob is out of alignment by approximately 120 degrees, follow the procedure below to re-align the knob. Make a 120 degree adjustment of the up down knob:

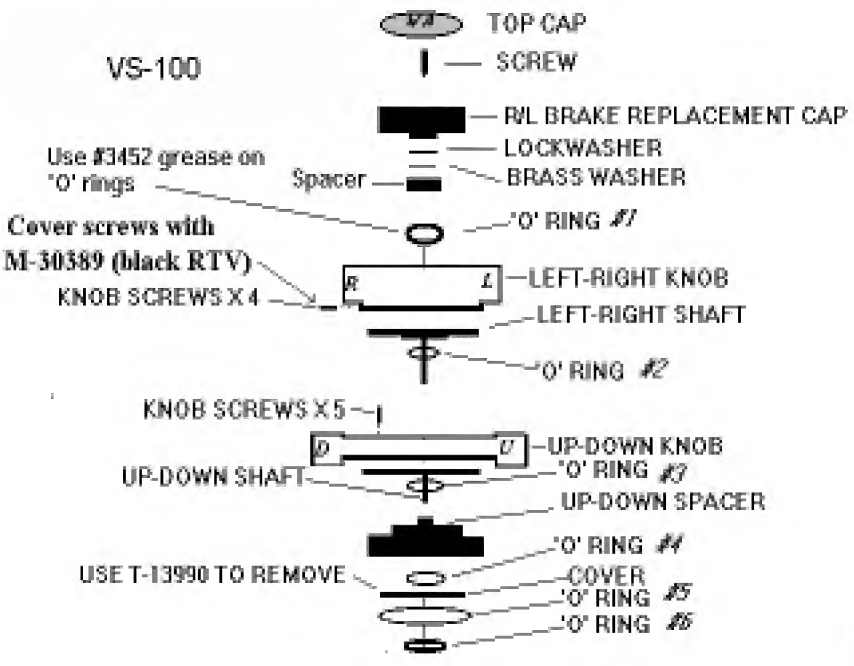
4.4.15.1 Remove three slotted head screws from the hub.

4.4.15.2 Rotate the knob to re-align.

4.4.15.4 Accomplish a 48 degree shift by moving 120 degrees and then backing up 72 degrees.

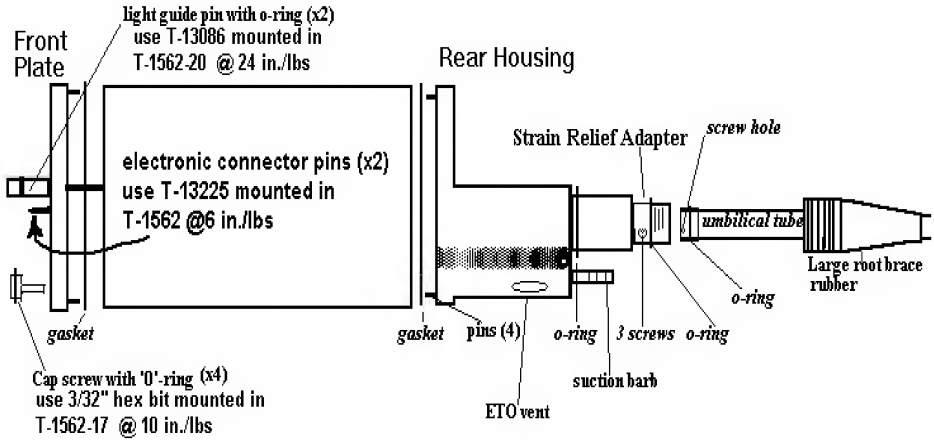
4.4.15.5 Accomplish a 30 degree shift by moving 120 degrees and then backing up 90 degrees.

4.4.16 **Reassemble the** knobs in reverse order us ing new O rings.
NOTE: Lubricate O rings with #3452 grease. After knob screws are inserted in knob and tightened, cover them with RTV M-30389.



4.5 Outline of Umbilical housing disassembly

Note: Whenever printed circuit boards are removed or camera assembly is replaced, it is necessary to perform special video adjustments on factory video equipment. This work is performed by a specially trained video technician. **Use ESD procedures when disassembling the umbilical housing.**



T-13225 removing connector nut.

T-13086 removing light guide retainer nut.

4.5.1 Remove 2 connector nuts with T-13225. Use a new teflon washers under each.

4.5.2 Remove 2 light guide retainer nuts with T-13086.

4.5.3 Remove 2 hex cap screws and with attached O rings with 3/32" hex key. Discard old O rings.

4.5.4 Break front plate gasket seal with razor knife through centerline of the gasket to prevent cutting powder coated surfaces. A cut will cause a leak at these sealing surfaces.

4.5.5 Remove front plate from umbilical middle housing.

4.5.6 Push the light guide retainers out of the front plate.

4.5 Outline of Umbilical housing disassembly continued

4.5.7 Remove residual gasket material from the middle housing and the front plate.

4.5.8 Remove the umbilical middle housing.

4.5.9 Remove the printed circuit board set but do not cut video cable. The condition of the printed circuit boards can now be determined.
A flooded scope will result in corroded boards and connectors.

Video boards can be inspected. Use ESD precautions.

4.5.10 Reassemble the umbilical housing in reverse order with the following notes and cautions. When installing connector pins, use a new Teflon seal Part Number 310172. Discard all 'O' rings unless they are in excellent condition. A full list of repair parts is listed in the Appendix section.

Teflon Seal PN 310172

4.5.11 Repaired Video Sigmoidoscopes must pass standard tests for safety, function and seal integrity. These tests are listed in Section 2 of this manual entitled "Service"

Appendix A*

*** Based on VS-100 Bill of Material 30500 Repair**
*** Based on VS-200 Bill of Material 31000 Repair**

Part Number	Description	30500	31000
106100-34	#4-40 PHPS X .1875 LG	✓	✓
106104-20	O-RING.650 X.045 EPDM,70D	✓	✓
106104-22	O-RING.158 X .039, EPDM 80D		✓
106104-24	O-RING.256 X.047 EPDM 70D	✓	✓
106104-25	O-RING.35 X.059 EDPM 80D	✓	✓
106104-27	O-RING"		✓
106106-1	#2 LOCKWASHER,INTERNAL TOOTH	✓	✓
106106-2	#4 INTRNL TOOTH LOCKWASHER	✓	
106108-14	O-RING	✓	✓
106108-16	O-RING.101 X.070 EPDM,70D		✓
106108-20	O-RING,.114 X .070, EPDM 70D		✓
106108-22	O-RING.301 X.070 EPDM,70D	✓	✓
106108-24	O-RING	✓	✓
106108-25	O-RING	✓	✓
106115-10	SPRING, COMPRESSION		✓
106121-13	3/16 HEAT SHRINK X .5 LG		✓
106121-14	3/64 HEAT SHRINK X .3 LG		✓
106123-1	SCREW CSM 2.0 X 3.0	✓	✓
106123-10	SCREW CSS 1.7 X 4.0	✓	✓
106123-11	SCREW CSS 1.7 X 4.5	✓	✓
106123-12	SCREW CSS 1.7 X 5.0	✓	✓
106123-13	SEGMENT ASSY ATTACH SCREW	✓	
106123-15	U/D KNOB PLATE ATT SCREW	✓	✓
106123-16	R/L KNOB ATTACHING SCREW	✓	✓
106123-17	SCREW M2 X 0.4 X 4MM	✓	
106123-2	SCREW CNM 1.7 X 2.0	✓	✓
106123-3	SCREW CSS 1.7 X 2.2	✓	✓
106123-4	SCREW CNS 1.7 X 2.5	✓	✓
106123-6	SCREW CSS 1.7 X 3.0MM	✓	✓
106123-7	SCREW CNM 1.7 X 3.0	✓	✓
106123-8	SCREW CSS 1.7 X 3.5	✓	✓
106123-9	SCREW CNM 1.7 X 3.5	✓	✓
106126-17	DOWEL PIN,416SS 1/16 X 5/16 LG		✓
106129-5	RING TERMINAL (AMP P/N 321013)	✓	✓
106129-6	RING TERMINAL (AMP P/N 323914)	✓	✓
106145-10	O-RING (1.5 X 15)	✓	
106145-11	O-RING (1.5 X15.5MM)	✓	✓
106145-12	O-RING (1.5 X 18MM)	✓	✓
106145-13	O-RING (1.5 X 20)	✓	✓
106145-14	O-RING (1.78 X 6.07)	✓	✓
106145-15	O-RING (1.78 X 8.4)	✓	✓
106145-16	O-RING (1.78 X 23.52)		✓
106145-17	O-RING (2 X 5)	✓	✓
106145-18	O-RING (2 X 7)	✓	✓
106145-19	O-RING (2 X 16)	✓	✓
106145-20	O-RING (2 X 22)	✓	✓
106145-21	O-RING (2 X 25)	✓	✓
106145-3	O-RING (1.27 X 4.47)	✓	✓

Part Number	Description	30500	31000
106145-6	O-RING (1.5 X 6)	✓	✓
106145-7	O-RING (1.5 X 8)	✓	✓
106145-8	O-RING (1.5 X 11.5MM)	✓	✓
106145-9	O-RING (1.5 X 12)	✓	✓
305004-501	UMB PLUG/SCOPE ASSY	✓	
305005-501	INS TB/STEERING ASY	✓	
305006	KNOB LABEL	✓	
305008-1	TERMINATION RING-FINISHED		✓
305010	R/L BRAKE RPLC CAP	✓	
305010-1	R/L BRAKE RPLC CAP PWDR CTD	✓	
305014-1	SPRING GUIDE COLLAR - FINISHED		✓
305016-502	VERTEBRAE ASSY	✓	✓
305017-4	LABEL, SIG MODEL/PATENT NO	✓	
305019-1	CORR CONTAINER, CARRYING	✓	✓
305020-502	INSERTION TUBE PRINTED 70CM		✓
305025-1	VS-100 CONTROL BODY SPACER	✓	
305025-2	VS-100 CONTROL BODY SPACER	✓	
305026-501	PACKING INSERT SET	✓	✓
305027	CORR SHIPPING CONTAINER	✓	✓
305034	SERVICE MANUAL 30500/40500	✓	
305035-501	OBJECTIVE HEAD ASSY-SIG		✓
305036-1	SERIAL NUMBER LABEL SIG/REPAIR	✓	✓
305040-501	INSERTION TUBE SUB ASSY	✓	✓
305056-501	CONTROL BODY ASSY	✓	
305143-501	INSERTION TUBE ASSY	✓	✓
305143-501R	INSERTION TUBE ASSY-REFURBISH	✓	
305143-502	INSERTION TUBE ASSY (DSP)		✓
305143-503	INSERTION TUBE ASSY		✓
305171-1	WARRANTY CARD	✓	✓
305199	INST MAN,VS100 VIDEO SIG	✓	
310002	AIR RETAINING RING-DISTAL	✓	✓
310006-501	UMB REAR HSG SUB ASSY	✓	
310006-502	UMB REAR HSG SUB ASSY	✓	✓
310008	STRAIN RELIEF ADAPTER		✓
310009	ADAPTER JAM NUT	✓	✓
310013	SUCTION BARB NUT	✓	✓
310014	AIR CONNECTOR		✓
310015	AIR TUBE FORMED	✓	✓
310016	WATER CONNECTOR		✓
310017	WATER TUBE FORMED	✓	✓
310018-501	ETO VENT ASSY	✓	
310021	ETO SHAFT		✓
310023-4	MIDDLE HSG,MACH/PWDR COAT/TXTR		✓
310026-1	NUT LIGHT GUIDE RETAINER	✓	✓
310027-501	LIGHT GUIDE RETAINER ASSY	✓	✓
310031	SUCTION BARB		✓
310032	VENT SCREW		✓
310036	SUCTION TUBE,FORMED	✓	✓

Part Number	Description	30500	31000
310039-1	SCREW SOCKET HD #4-40 X 2.62		✓
310039-2	SCREW SOCKET HD #4-40 X .375		✓
310040-2	GASKET, UMBILICAL	✓	✓
310041	LG ROOT BRC RUBBER W/RIBS		✓
310042	LG ROOT BRC RUBBER W/O RIBS		✓
310043	UMBILICAL TUBE	✓	
310044	ROOT BRACE RUBBER	✓	✓
310045	INSERTION TUBE ATTACHING NUT	✓	✓
310046-501	CONTROL BUTTON CABLE ASSY		✓
310051	RING CONNECTOR		✓
310053-501	FRONT PLATE ASSY	✓	✓
310056-502	CONTROL BODY ASSY		✓
310062	BIOPSY INLET ATTACH NUT	✓	✓
310063	BIOPSY INLET PIECE	✓	✓
310064	BIOPSY INLET BARREL	✓	✓
310065	FWD BODY TRIM CVR NUT	✓	✓
310066	FWD BODY TRIM COLLAR	✓	✓
310067	JOINT SEAL RING	✓	✓
310069	BODY COVER GRIP ATT NUT	✓	✓
310070-501	BODY COVER GRIP W/O-RING	✓	✓
310076	POLYSLIDER	✓	✓
310077	R/L PULLEY ASSY	✓	
310077-1	R/L PULLEY ASSY SST CABLE		✓
310077-2	R/L PULLEY ASSY TUNG. CABLE	✓	
310078	PIVOT F/CONTROL KNOB	✓	✓
310079	SUCTION VALVE PVE	✓	✓
310080	A/W FEEDING VALVE	✓	✓
310083	BENDING RUBBER	✓	✓
310085	AIR RETAINING RING-UMB	✓	✓
310087	WATER SUPPLY TB RET RING	✓	✓
310088	ETO BODY		✓
310089-2	REAR HSG UMBILICAL,POWDER CT		✓
310094	SIDE BODY COVER W/O-RING	✓	✓
310095	LG CABLE TRIM COLLAR	✓	✓
310100	FWD BODY FRAME		✓
310103	O-RING SPECIAL (1)	✓	✓
310105	GUIDE PLATE COVER		✓
310107	INTERMEDIATE PLATE		✓
310108	HOLDER COVER		✓
310110	U/D STOPPER RETAINER	✓	✓
310111	D-STOPPER	✓	✓
310112	U/D GUIDE PLATE		✓
310113	U-STOPPER	✓	✓
310114	R/L GUIDE PLATE	✓	✓
310116	R-STOPPER	✓	✓
310117	STAYCOIL HOLDER BRACKET		✓
310118	L-STOPPER	✓	✓
310119	R/L KNOB	✓	✓

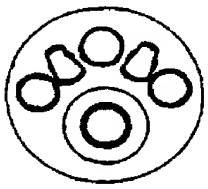
Part Number	Description	30500	31000
310120	R/L LOCK KNOB ASSY		✓
310121	TIGHTENING SCREW		✓
310122	EXTENSION SCREW SHAFT		✓
310123	R/L CLICK SPRING		✓
310124	R/L FRICTION ASSY		✓
310125	LOCKWASHER	✓	✓
310126	WASHER	✓	✓
310127	R/L FRICTION DISK		✓
310128	R/L PRESSURE SCREW		✓
310129	R/L KNOB SHAFT		✓
310130	U/D KNOB PLATE	✓	✓
310131	U/D KNOB	✓	✓
310132	U/D KNOB SHAFT		✓
310133	U/D LOCK LEVER UNIT		✓
310134	CONTROL BODY LID	✓	✓
310135	PULLEY HOUSING	✓	✓
310136	U/D PULLEY ASSY	✓	
310136-1	U/D PULLEY ASSY SST CABLE		✓
310136-2	U/D PULLEY ASSY TUNG. CABLE	✓	
310138	STAYCOIL COLLAR		✓
310148	CONNECTING RECEPTACLE	✓	✓
310148-1	CONNECTING RECEPTACLE		✓
310158-2	MODEL NUMBER LABEL VS-200		✓
310161	A/W TUBE RETAIN COLLAR	✓	✓
310170	GASKET, HYPERTRONICS	✓	✓
310171	PIN, GUIDE		✓
310172	SEAL, TEFLON		✓
310176	CONNECTOR, WATER TUBE		✓
310177	CONNECTOR, AIR TUBE		✓
310183	BIOPSY SEALS (10/BAG)		✓
310184	SUCTION VALVE O-RINGS		✓
310185	A/W VALVE O-RING		✓
310190	DISTAL CLEANING/DISINFECT CAP		✓
310191-501N	SHIPPING /ETO VENT		✓
310199	INST MAN,VS200 VIDEO SIG		✓
31020	CLEANING BRUSH	✓	✓
310202-2	60CC SYRINGE	✓	✓
310204	O-RING KIT INSTRUCTIONS		✓
310205	O-RING KIT INSTRUCTIONS		✓
310224	UMBILICAL TUBE COLLAR		✓
310225-501	UMBILICAL TUBE		✓
31021	A/W & SUCTION CLNG DISINF CAPS	✓	
31024	A/W VALVE O-RING KIT	✓	✓
31025	SUCTION VALVE O-RING KIT	✓	✓
31027	A/W CLEANING DISEN ADAPTOR	✓	✓
31028	SOAKING CAP	✓	✓
31029	SHIPPING/ETO VENT CAP	✓	✓
31031	SUCTION CYL CLEANING BRUSH	✓	✓

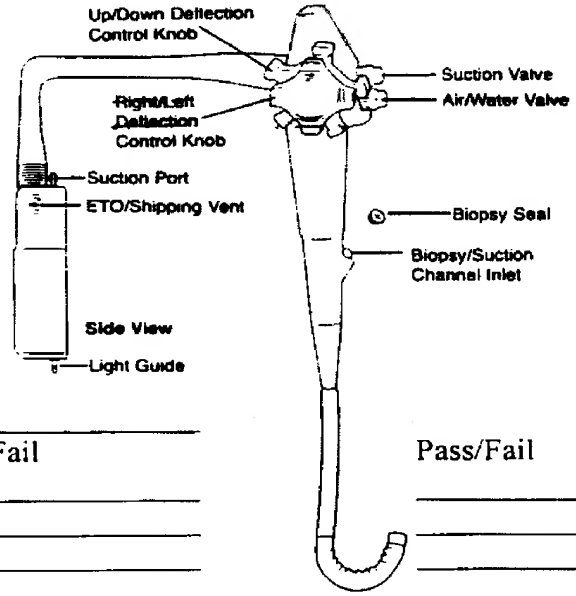
Part Number	Description	30500	31000
31038	SUCTION DISINFECTION ADAPTER		✓
31039	(BIOPSY SEALS)(5)		✓
31041	VS-200/VC-200 ACCESSORY KIT		✓
317506	ADJUSTING COLLAR	✓	✓
317518	CHANNEL RETAINING COIL	✓	✓
317519-501	BIOPSY INLET T-PIECE ASSY	✓	✓
317520	FWD BODY COVER W/O SIDE HOLE	✓	✓
317521	FWD BODY FRAME	✓	
339048	VALVE LUBRICANT ASSY	✓	✓
33913	SUCTION TUBING		✓
339146	VERTEBRAE		✓
339201-2	SPRING GUIDE		✓
33924	CLEANING BRUSH	✓	✓
33930	BIOPSY SEALS (10 EACH)	✓	
339301	BIOPSY SEAL	✓	
339314	ETO INSTRUCTION TAG		✓
339315	SPLIT RING		✓
339333-2	OETIKER CLAMP	✓	✓
339333-3	OETIKER CLAMP	✓	✓
339333-5	OETIKER CLAMP 6.1	✓	✓
339333-7	OETIKER CLAMP	✓	✓
339352	CLEANING BRUSH		✓
339353	BRUSH REFILLS		✓
339340-501	CARRYING CASE	✓	
339376-502	STEERING, CONTROL WIRE		✓
339376-503	STEERING, CONTROL WIRE	✓	
455022-501	DISINFECT CAP ASSY, A/W		✓
455025-501	DISINFECT CAP ASSY, SUCTION		✓
807356	SCOPE/CONNECTOR ASSY		✓
808358	SIG VIDEO ADJ		✓
A04049	TEST SPEC VIDEOPATH SCOPES	✓	✓
H1587	TIE WRAPS		✓
H1697	#4 INT, TOOTH LOCKWASHER		✓
H5090	#4-40 PHPS X .1875 LG		✓
H7800	MASTERBOND, EP424T-CLEAR		✓
H7924	SCREW PLATE, HYPERTRONICS		✓
H9657	AIR/WATER JET		✓
H9674	SPREAD LENS		✓
M11265	4368 MOLD RELEASE	✓	
M11380	ALCONOX DETERGENT		✓
M11392	CHAIN LINK		✓
M11399	SNOOP	✓	
M11403	BABY POWDER		✓
M11446	ANTISTATIC GLOVES	✓	
M11447	ANTISTATIC TAPE 1/2	✓	✓
M11448	MONOFILAMENT	✓	✓
M15024	BRAID	✓	✓
M30210	608 EPOXY KIT		✓

Part Number	Description	30500	31000
M30333	LOCTITE 495 SUPER BONDER		✓
M30341	BLACK MAX	✓	
M30348	LOCTITE 414		✓
M30375	LOCTITE-222		✓
M30383	MASTERBOND EP42HT EPOXY	✓	✓
M30389	SILICONE THDLOCK KE445-B	✓	✓
M30392	WHITE SILICONE KE-45-W	✓	✓
M30396	MASTERBOND EP42HT-1 EPOXY	✓	
M30399	LOCTITE 712 ACCELERATOR	✓	
M31405	SOLDERING FLUX	✓	✓
M31415	430 SILVER SOLDER	✓	✓
M31426	.032DIA ENERGIZED ROSIN SOLDER		✓
M31448	INDALLOY FLUX#2		✓
M31449	SUS SOLDERING FLUX	✓	✓
M31451	5760 NEUTRALIZER	✓	✓
M31452	TIP TINNER/CLEANER	✓	✓
M32015	24 AWG GREEN 7/32 PVC WIRE	✓	✓
M40154	DE-IONIZED WATER		✓
M40156	DOW CORNING 3452 LUBE	✓	✓
M40158	MOLYBDENUM CRYSTALLINE LUB	✓	✓
M40162	99% ISOPROPAL ALCOHOL	✓	✓
M40164	DRUERUTE DESICCANT	✓	

Appendix B

	Initial	Final
Video Image:	A _____ C _____	A _____ C _____
Horizon:	_____	_____





Cracks? Y or N		
Epoxy Voids? Y or N		
Nozzles:	_____	
Leak Test:	Pass/Fail	Pass/Fail
Leak Location(s):	_____	_____
	_____	_____
	_____	_____
Scope Cleaned?	Yes/No	
Other Findings:	_____	_____
	_____	_____
ETO Vent	Pass/Fail	Pass/Fail
Valve O-Rings:	Pass/Fail A/W/S	_____
Articulation:	Up_____	Up_____
	Down_____	Down_____
	Left_____	Left_____
	Right_____	Right_____
Tracking:	Pass/Fail	Pass/Fail
Springback:	Pass/Fail	Pass/Fail
Brake:	Pass/Fail	Pass/Fail
FreePlay:	Pass/Fail	Pass/Fail
Biopsy Channel:	Pass/Fail	Pass/Fail
	Gauge Flow	Gauge Flow
Air Flow:	_____ _____cc/min	_____ _____cc/min
Water Flow:	_____ _____ml/min	_____ _____ml/min
Suction Flow:	_____ _____ml/min	_____ _____ml/min
Hypot Test:	Pass/Fail	Pass/Fail
Leakage Current:	Pass/Fail	Pass/Fail
Ground Continuity:	Pass/Fail A/W/S	Pass/Fail
Printer Button Test:	Pass/Fail	Pass/Fail
Light Transmission:	_____%	_____%

Customer Name:_____ RCVD:_____

Serial Number:_____ Loaner: Y or N

Received / Cleaned By:_____ Purchase Date: __/__/__
Sterilization / Disinfection Method:_____ RMA#_____
Priority Code:_____ Prior Returns: Y or N

Reason for Return:_____

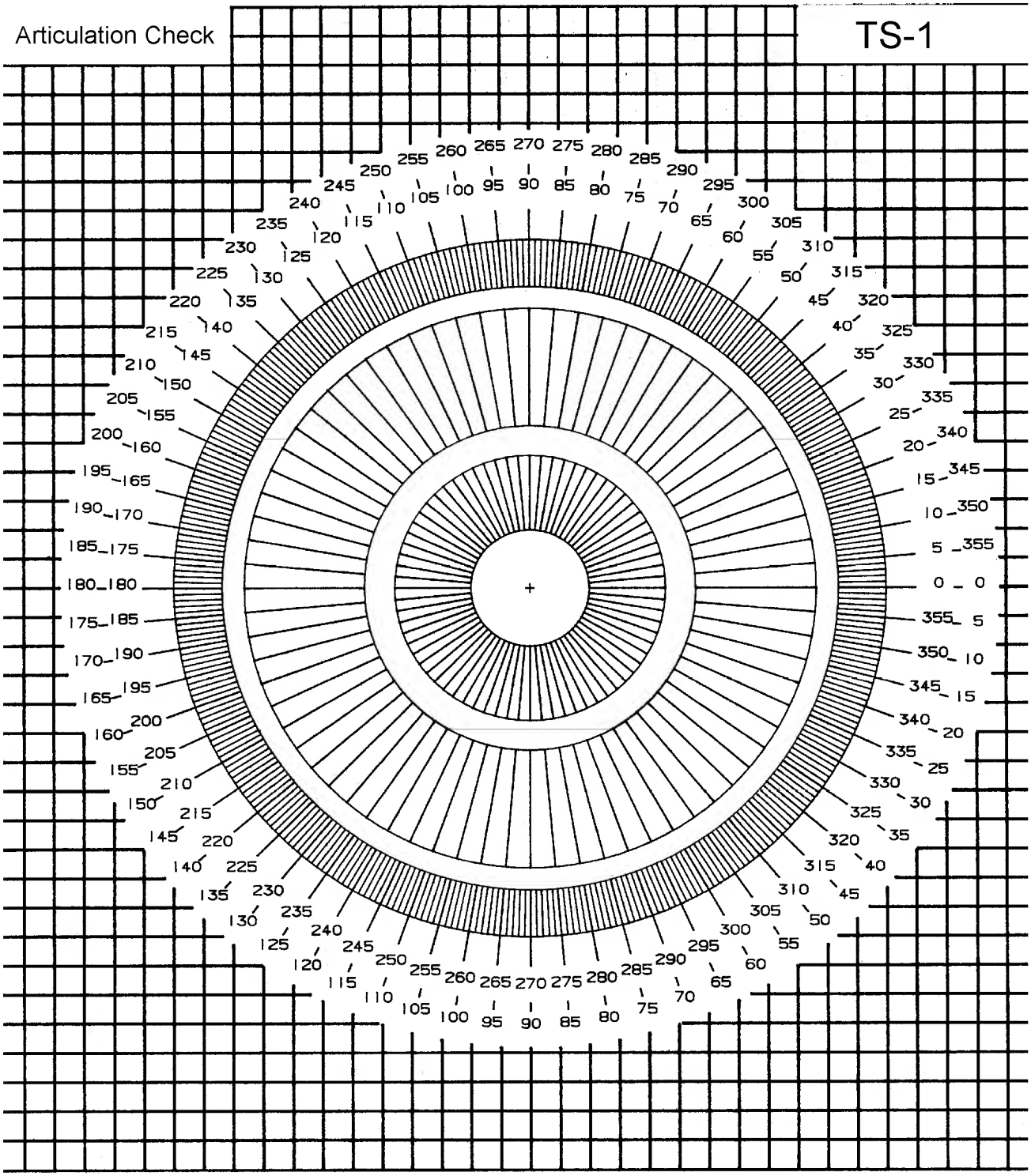
IN	Out		IN	Out	
___	___	A/W Plunger	___	___	A/W Cleaning Cap
___	___	Suc Plunger	___	___	Suc Cleaning Cap
___	___	ETOVent Cap& Tag	___	___	Suc Plgr Oring Kit
___	___	Biopsy Seals	___	___	A/W Plgr Oring Kit
___	___	60cc Syringe	___	___	Man. A/W Cln Asy
___	___	Cleaning Caps (Red)	___	___	Reg. Card
___	___	Cleaning Brushes	___	___	Instruction Manual
___	___	Nozzle Brush Kit	___	___	Suction Tubing
___	___	Soaking Cap	___	___	Suc Disinfect Adpt
___	___	Valve Lubricant	___	___	Other (Specify)

_____

_____

Return Codes

Part Number	Qty	Fail Code	Act Code	Mater. (over) $	Labor Time Billable	Labor Time Actual	Warr Y/N	Total $ Material & Labor	Parts Ordered date
Evaluation	1		EVA		2:00				


Articulation Check
TS-1

Appendix C

Appendix C

List of Reference Drawings Required for Full Service

VS-100 Drawings

Description Dwg	Part Number	Drawing Number	Size	Rev.	Sheets
Rear Housing Assembly	310006-501N	310006	D	H	1 of 1
ETO Vent Assy	310018-501N	310018	B	C	1 of 1
Insertion Tube Steering Ass'y	305050-501	305005	C	C	1 of 1
Objective Head Ass'y (Sig)	305035-501	305035	D	F	1 of 1
Scope Sub-Ass'y VS-100 Video Sig w/ Parts Kit	305099-502	305099	D	H	1 of 1
Control Body Ass'y	305056-501	305056	B	B	1 of 1
Control Body Ass'y Complete	305146-501N	305146	D	F	1 of 1
VS100 Sig Video Adj		305100	D	C	1 of 1
VS-100 Video Sig w/Accessories		305000	D	A	1 of 1
Umbilical Plug Scope Ass'y		305004	D	G	1 of 1
VS-100 Video Sig 70CM	305102-501N	305102	D	D	1 of 2
VS-100 Video Sig 70 CM	305102-501N	305102	D	A	2 of 2
Insertion Tube Ass'y	305143-501N	305143	C	C	1 of 1
Vertibrae Ass'y	305016-501N	305016	C	B	1 of 1
Termination Rim	Objective Head	305008	C	D	1 of 1
Assembly Modular Color VP Board		805554	D	T	1 of 1
Interchangeable Color Board		805695	D	E	2 Sheets
Ass'y Scope Connection	809238 (VS-100,DSP)	809238	D	J	1 of 1
Ass'y VS-100 Board Set		808243	B	A	1 of 1
Schematic Modular Color Mother Board		805694	B	B	1 of 1

VS-200 Drawings

Drawing Description	Part Number	Drawing Number	Size	Rev.	Sheets
Ass'y Scope Connection		809238	D	J	1 of 1
VS-200 Scope Connector Ass'y	807356	807356	D	B	1 of 1
VS-200 Sig Video Adjust		808358	D	B	1 of 1
VS-200 Video Sig 70 CM	310102-501N	310102	D	C	1/2 Sheets
Button Control Board		807140	B	A	1 of 1
Control Body Frame Assy Unit	310056-502	310056	B	C	1 of 1
VS-200 Scope Sub Ass'y	310099-501	310099	D	C	1 of1
Umbilical Plug Scope Ass'y	310004-501N	310004	D	D	1 of 1
Insertion Tube/Steering Ass'y	310005-501N	310005	C	C	1 of 1
Control Body Ass'y Complete	310146-501N	310146	D	E	1 of 1
Umbilical Tube		310227	B	A	1 of 1
VS200 Sig Video Adjustment		310084	D	C	1 of 1

30500 & 31000 Repair Process Specs

Process Spec.	Description	Size	Rev.	Pages
A03332	VS-100 Air/Water Line Rework	A	A	3
A02860	Bead Inspection	C	A	1
A04049	Test Spec VideoPath Scope	A	C	7
P02454	VS-200 Scope Connector Process	A	B	8